EXHIBIT 2 TO RESPONSE TO MOTION TO MOTION TO EXCLUDE EXPERT TESTIMONY

Dr. Roe's curriculum vitae

[redacted] Ph.D.

Motto: "*In everything, commit yourself to excellence and integrity.*"

EXECUTIVE SUMMARY

I am a life-long learner and proactive leader with a record of innovation. I create an environment of technical excellence, and I personally invest in each team member to solve challenging national security problems.

SALIENT INFO.

- 25 years of hands-on and field experience in engineering, math & AI
- 20 years of Intelligence Community and DoD experience
- PI for 7 NSA, 5 AFCYBER & other USG classified programs
- Authored 7 textbooks and +60 peer-reviewed publications
- 2 US patents, 4 US patents-pending in CyberAI
- Active TS//SCI with NSA & CIA full-scope poly
- 7 OCONUS deployments supporting DoD & IC operations.

DEGREES

- Ph.D. Electrical Engineering; University of California, Riverside
- M.S. Electrical Engineering; University of California, Riverside
- M.S. Mechanical Engineering; University of California, Davis
- M.S. Aeronautical Engineering; Von Karman Institute, Belgium
- B.S. Mechanical Engineering; University of California, Davis
- B.S. Aerospace Engineering; University of California, Davis

PROFESSIONAL EXPERIENCE HIGHLIGHTS

- **Leidos** 2020-Present
  Vice President, AI Chief Scientist, Technical Fellow
- **National Intelligence University** 2023-Present
  Board of Advisors and Adjunct Professor
- **ODNI** (Joint Duty Assignment) 2019-2020
  AI/ML senior-level expert with oversight for all 16 IC agencies
- **NSA** 2015-2020
  Chief Data Scientist, Mathematician, Cyber Exploit Dev., Analyst
- **Roysdon LLC** 2010-Present
  CEO and Technical Advisor to IC and DoD agencies
- **Kratos** (formerly, Composite Engineering Inc.) 2005-2015
  Senior Research Engineer, Flight Test Director, Aircraft Design, GNC
- **Cal Space** 2002-2005
  Research Engineer, Aircraft Design, GNC
- **San Diego Aerospace Museum** 1995-1999
  Engineering Apprentice

CONTACT INFO.

Boerne, TX 78006
916-796-3809
roysdon@protonmail.com

UNIQUE SKILLS

- Voracious technical reader and writer
- Charismatic public speaker
- Prolific researcher
- An optimist with a high team dynamic

TECH. & PROFESSONAL SKILLS

- **AI/ML**: Machine learning, reinforcement learning, deep learning, transformers
- **Cyber**: Exploit dev: firewalls, SIEMs, EDRs
- **Aero**: Aircraft design, simulation, GNC
- **Nav**: Optimal Bayesian state estimation, sensor-fusion, Kalman Filters, GPS-INS
- **Tools**: Matlab, Simulink, Python, C/C++

AWARDS, HONORS & CERTS

- **Aspen Institute Exec. Leadership**, 2023
- Leidos: **CTO Award**, 2021 & 2023
- Leidos: **Innovation in R&D Award**, 2021
- ODNI: **Directors Award,** 2020
- NSA: **Directors Reserve Award**, 2020
- NSA: **Inventors Award**, 2019
- NSA: **Excellence in Leadership**, 2019
- NSA: **SEL: Top Performer Award**, 2018
- UCR: **Dean Distinguished Scholar**, 2013-17
- UCD, Mensa & USG tested **IQ = 174**, 2000
- FAA Private Pilot License, **Aerobatics**, 2010
- Performed 11 pieces in **Carnegie Hall**, 2001

WEBSITES

- https://pfroysdon.github.io
- https://www.roysdonfibonaccipress.com
- https://www.roysdonwatchco.com

[redacted] Ph.D.

Motto: "*In everything, commit yourself to excellence and integrity*."

ASSIGNMENTS & ACCOMPLISHMENTS

Leidos **2020 – Present**

Vice President, AI Chief Scientist, Technical Fellow & Master-level Solution Architect

- Leidos is a Fortune 250 company of 48,000 employees and a $20 B annual revenue.
- Mentored by senior executive and General Council, Mr. Jerry Howe.
- As **Principal Investigator (PI)** for **Cyber Artificial Intelligence (AI) and Machine Learning (ML) research**, I created the Leidos Offense/Defense CyberAI research portfolio from scratch, built a team of 18 researchers, and led the team to a successful demonstration of 7 projects in less than 6 months. Managed a $15M budget over 3 years. This research led to **6 US patents-pending, and 3 conference papers** (NeurIPS 2023, IEEE ICNC 2024). Led several successful customer demos using our **CyberAI tools to exploit firewalls, IDS's, SIEM's, EDR's and AV's**.
- As **AI Chief Scientist**, I provided general AI guidance across all Leidos business sectors (Civil, Health, Defense, and Intelligence). I co-authored several DARPA, IARPA, Intelligence Community (IC) and DoD proposals.
- As **PI for Horizon Research & Development**, managed $5M budget, led and guided research in Quantum Physics, AI Computational Biology, Cyber AI, and AI Cryptanalysis.
- Led successful proposal team and DARPA CASTLE program.
- **Received three awards for pioneering AI/ML work** at Leidos, **including the CTO Award and Innovation in R&D Award**.

National Intelligence University (NIU) **2023 – Present**

Board of Advisors

Advise on course material and research for **Cyber, AI, Mathematics, and Data Science**.

Adjunct Professor – School of Science and Technology Intelligence

Instruction in AI, ML, Data Science, and a **Math Refresher** for graduate students based on my book "Math Refresher for AI & Machine Learning".

Office of the Director of National Intelligence (ODNI) **2019-2020**

AI Technical Fellow (Joint Duty Assignment, Sept 2019 - Aug. 2020)

- **Co-led, at the SES-level, the execution of National Security Presidential Memorandum-18 (NSPM-18) – an IC-wide effort to implement AI/ML in every mission**, co-managed multi-million dollar budget.
- Mentored by senior executive, Mr. Dean Souleles.
- Regularly briefed the Principal Deputy Director of National Intelligence, members of Senate Select Committee on Intelligence (SSCI), House Permanent Select Committee on Intelligence (HPSCI), and Senate Appropriations Committee (SAC) on topics of AI/ML.
- Led development of IC-wide training pipeline for Data Science (DS) and AI/ML.
- **Refereed the ODNI AI Ethics Framework for the IC**, and DS syllabus/course material for DDIU, NIU and NCS.
- **Built online classified AI/ML curriculum** used by DS practitioners at ODNI, NSA, FBI, and other IC & DoD agencies.
- **Received numerous awards for pioneering AI/ML work in the IC, including Director Award**.

National Security Agency (NSA) **2015-2020**

Chief Data Scientist & Mathematician*, NSA-Texas*

- **Built and led the NSA data science team, and mentored NSA and IC data scientists deployed world-wide**.
- Mentored by mathematician Dr. Joe McCloskey, and seniors Mr. David R., and Mr. James S.
- Created and taught the first offering of basic, intermediate, and advanced DS Bootcamps.

- Created and taught the first DS course for NSA Resident Signals Engineer (RSE) program.
- Created an "Intro to AI/ML" course for the NSA Data Science Development Program (DSDP).
- Developed a new math technique that solved a cryptanalysis problem. Software written in C++ and Matlab.
- **Received numerous awards for pioneering AI/ML work in the IC, including the NSA Directors' Reserve Award and the NSA Innovation Award**.

Data Science Academic Liaison, University of Texas.
Refereed the DS curriculum for BS and MS programs.

Cyber Tool Developer, NSA-Texas, Tailored Access Operations (TAO) and Computer Network Operations (CNO)
Built AI-enabled cyber network tools in C++, Matlab and Python.

Analyst, NSA-Washington, Weapons and Space
FISINT and SIGINT analyst. **Built AI-enabled signal processing algorithms** in Matlab for signal detection and tracking.

Roysdon LLC **2010-Present**

Owner

- Technical advisor and consultant to Air Force Cyber and several IC and DoD agencies.
- Mentored by renowned UC Riverside Professor Dr. Jay A. Farrell.
- As PI on 7 classified CyberAI programs, **designed state-of-the-art AI, ML, and Adversarial ML algorithms on cyber-physical systems for IC and DoD customers**, managed $75M budget. Prototypes built in Python, Matlab and C++.
- Designed state-of-the-art GPS-INS optimal nonlinear Bayesian state estimation algorithms and digital signal processing (DSP) algorithms in Matlab & Simulink, designed and built PCB navigation system hardware and C++ software for real-time airborne civilian, military, and IC systems.
- Designed and built software-in-the-loop (SWIL) and hardware-in-the-loop (HWIL) 6 degrees-of-freedom (6DOF) flight simulators for aerial vehicles. Software written in C++ and Matab.
- Reverse-engineered 2 foreign autopilots and 3 navigation systems.
- Designed, manufactured, and sold state-of-the-art autopilot systems using modern control theory, 2-axis and 3-axis gimballed camera stabilization systems, and a state-of-the-art GPS-aided inertial navigation system using modern nonlinear optimization theory. Software written in C++ and Matab.
- Built and maintain analysis and real-time embedded software toolboxes: RoysdonAero, RoysdonCyber, RoysdonNav

Aero Analysis LLC **2010-2013**

Co-owner

- This was an incredible company that I built and sold in three years. The technology was based on my M.S. research in aircraft design and early Ph.D. research in modern navigation, guidance and control (GNC). I was fortunate to build this company, because the aircraft design and GNC theory was vastly different from my work at CEi.
- In a very short time I reverse-engineered one autopilot system and one 3-axis camera gimbal, authored three autopilot systems, one 2-axis and one 3-axis camera gimbal system, developed high-fidelity nonlinear 3DOF & 6DOF flight simulators , and built several flight vehicles and sold complete UAV and gimbal systems nation-wide.
- Systems designed and manufactured include:
  - **AF-1**: 3m fixed-wing airplane, electric, capable of 2.5 hours of autonomous flight. Built one prototype.
  - **AF-2**: 1.2m flying wing airplane, electric, capable of 45 min. autonomous flight. Sold 20 vehicles.
  - **AH-1**: 450mm-class quad-copter, capable of 22 min autonomous flight. Built one prototype for a customer.
  - **AH-2**: 800mm-class octa-v multi-copter, capable of 15 min autonomous flight. Built one prototype for a customer.

- **AH-3**: 600mm-class hexa multi-copter, capable of 15 min autonomous flight. Built one prototype.
- **AH-4**: 600mm-class hexa Y6 multi-copter, capable of 15 min autonomous flight. Built one prototype.
- **AH-5**: 800mm-class octa-x multi-copter, capable of 12 min autonomous flight. Built one prototype.
- **AH-6**: 200mm-class quad-copter, capable of 20 min. semi-autonomous flight. Sold 20 vehicles to Mathworks.
- **AH-7**: 100mm-class quad-copter, capable of 8 min. semi-autonomous flight. Sold 35 vehicles.
- **AA-1**: Autopilot flight stabilization for co-axial, bi/ tri/ quad/ hexa/ octa-copters, flying wing, & airplanes.
- **AA-2**: Upgraded AA-1 with waypoint navigation. Built one prototype for a customer.
- **AA-3**: Upgraded AA-2 with GPS-INS using a 17-state Extended Kalman Filter. Built one prototype for a customer.
- **AG-1**: 2-axis camera gimbal & controller with servo-motors. Built one prototype for a customer.
- **AG-2**: 3-axis camera gimbal & controller with brushless-motors. Built one prototype for a customer.

Kratos (formerly Composite Engineering Inc.) **2005-2015**

Advanced Programs - ***Senior Research Engineer***

"It's not the age, it's the mileage." This sentiment is certainly true because I helped build this company from a small startup to a large defense contractor, working nearly 80 hrs/wk for 10 years and gained a lifetime of experience**.**

- Mentored by renowned aerospace engineers Dr. Dan P. Raymer and Mr. Doug A. Meyer.
- Multiple classified programs for CIA and DoD.
- Principal engineer and project lead on 6 aircraft designs and 1 navigation system.
- Reverse engineered 3 foreign military unmanned aerial vehicles (UAVs) and 2 cruise missiles.
- **Used ML for vehicle design optimization, flight performance optimization, and post-flight analysis**.
- Built and maintained 4 SWIL and 2 HWIL 6DOF flight simulators. Software written in C++ and Matab.
- Experimental development and hands-on testing experience in the following areas:
  - **Wind tunnels**: wind tunnel CAD model design, as well as wind tunnel testing and analysis in the following subsonic to hypersonic wind tunnels: Von Karman Mach 30 blow-down wind tunnel (WT), Von Karman Mach 30 Plasmatron WT, Von Karman transonic WT, Von Karman water tunnel, NASA Ames 40'x80' WT, CalSpan transonic WT, AFRL and Air Force Academy water tunnel, Wichita State low-speed WT (LSWT), Washington State LSWT, UC Davis LSWT, Von Karman 1 m and 3 m LSWT.
  - **Mass Properties**: vehicle mass properties CAD model design and analysis, full-scale testing in the Eglin AFB "Big I" test chamber.
  - **Radar**: vehicle radar cross-section design and analysis, full-scale testing at Pt. Mugu NAS anechoic chamber.
  - **Environment**: vehicle test chambers for thermal (heat/cool), shake / vibration, humidity and water immersion.
  - **Flight testing**: full-scale flight testing at Utah (UTTR) test range, Blue Sky Nevada (Area 51), Pt. Mugu Navy test range, Eglin AFB and Tyndall AFB test range, Alamogordo New Mexico Army test range, as well as international test ranges in: Australia, Taiwan, South Korea, United Kingdom, Germany, France, Spain, UAE, Saudi Arabia, Sweden, and Greece.
- Co-designed, tested & deployed, 6 different military UAV & cruise-missile systems**,** 3 ground-launch systems, and 1 air-launch system, 2 tethered aerial decoy systems, +120 aircraft fielded & flown.
  - **BQM-167A/i:** *a turbojet, Mach 0.91, 9G capable, 0-50k feet, high-performance UAV.*
    Responsible for aerodynamics performance calculations, water-tunnel and wind-tunnel data analysis, 6DOF flight simulation, and autopilot G&C software. Performed RATO-launch performance calculations. Provided flight test support at Eglin & Tyndall AFB, and international tests in Australia, the United Kingdom and South Korea. Provided USAF operational flight support at Tyndall AFB.
  - **ZGQM-173A:** *Mach 3.5, 10G capable, cruise-missile emulator.*
    Assisted in US Navy contract proposal technical writing, as well as aircraft conceptual design, flight simulation, subsonic and supersonic wind-tunnel data analysis.
  - **ZBQM-177 Technology Demonstrator**: *Mach 1.25, 9G capable, 0-40k feet, cruise-missile emulator.*

Co-architect of aircraft design and vehicle layout. Responsible for flight performance calculations, SystemID, water-tunnel and transonic wind-tunnel data analysis, VLM, CFD, 6DOF flight simulation, aerial decelerator 3DOF simulation, and autopilot G&C software. Performed rocked-assisted-take-off (RATO) launch performance calculations. Assistant Flight Test Director at Pt. Mugu NAS.

- **BQM-177A/i:** *a turbojet, Mach 0.95, 9G capable, 0-40k feet, cruise-missile emulator.*
  Responsible for CINS integration. Assisted in aircraft design, performance calculations, water-tunnel and transonic wind-tunnel data analysis, vortex lattice method (VLM) analysis, computational fluid dynamics (CFD) analysis, 6DOF flight simulation, aerial decelerator 3DOF simulation, and autopilot G&C software. Provided flight test support at Pt. Mugu NAS, Blue Skies NAS, and international tests in Taiwan.
- **ZMQM-178 Technology Demonstrator:** *Mach 0.85, 6G capable, 0-30k feet, high-performance UAV.*
  Co-architect of aircraft design and vehicle layout. Responsible for VLM, CFD, 6DOF flight simulation, SystemID, water-tunnel and transonic wind-tunnel data analysis, and autopilot G&C software. Performed catapult-launch performance calculations. Assistant Flight Test Director at Nevada Test Range, Flight Test Director at Australia Test Range.
- **MQM-178A/i:** *a twin-turbojet, Mach 0.85, 6G capable, 0-30k feet, high-performance UAV.*
  Responsible for CINS integration. Assisted in aircraft design, CFD, 6DOF flight simulation, water-tunnel and subsonic/ transonic wind-tunnel data analysis, autopilot G&C software. Performed System Identification (SystemID) using neural networks (i.e. machine learning) and state estimation. Provided flight test support at Orogrande AAB, and international tests in Australia, Greece, Saudi Arabia, S. Korea, Sweden, and Taiwan. Provided US Army operational flight support at Orogrande AAB.
- **UCAS Technology Demonstrator:** *a high-performance UAV demonstrator for DARPA and the US Navy.*
  Co-designed flight automation algorithms, e.g. formation flight, navigation, and anti-collision.
- **CEi Inertial Navigation System (CINS):** *a tactical-grade GPS-Baro-aided INS with an EKF.*
  Principle Engineer and co-author. Performed sensor selection. Co-authored and tested software. Led flight testing (52 flights) on an aerobatic airplane. Authored an in-house Signal Generator (full GPS constellation, IMU, Air Data, Radar Altimeter signals), as well as automated test tools, and a data parser.
- **CEi Data Acquisition System (CDAQ):** *a 1,000Hz DAQ, with GPS-INS and 20 analog-to-digital ports.*
  Principle Engineer. Authored all embedded and analysis software. Designed printed-circuit-board. Led flight testing and fielding of 10 units for use on CEi rocket-launch characterization tests.

Cal Space (University of California Center of Excellence for Aerial Survey) **2002-2005**

Research Engineer

- Designed and built a 4-meter fixed-wing UAV for aerial survey with multi-spectral and thermal cameras. **Used ML and convex optimization for vehicle design, and flight performance optimization**. Software written in C++ and Matab.
- Mentored by renowned UC Davis Professor Dr. Jean-Jacques Chattot.

San Diego Aerospace Museum **1995-1999**

Engineering Apprentice

- Learned engineering design and analysis, as well as the basic principles of aerodynamics, thermodynamics, RF communication and navigation systems.
- Mentored by renowned rocket scientist and engineer Mr. Ray T. Crowell.

PEER-REVIEWED PUBLICATIONS

- Textbook: “Machine Learning – a Conceptual Approach,” Fibonacci Press, (in peer-review).
- Textbook: “Math Refresher for AI & Machine Learning,” Fibonacci Press, 2023.

- Textbook: "Math Handbook for AI & Machine Learning," Fibonacci Press, 2023.
- Textbook: "How to do Research, Remotely!" Fibonacci Press, 2022.
- Textbook: "Math Refresher for Machine Learning," Fibonacci Press, 2013 & 2019.
- Textbook: "Math Handbook for Machine Learning," Fibonacci Press, 2013 & 2019.
- Textbook: "Optimal Nonlinear Bayesian Estimation & Sensor Fusion," Fibonacci Press, 2017.
- Textbook: "The Absolute Beginners Guide to Neural Networks," Fibonacci Press, 2014 & 2018.
- +60 journals, articles, conference papers, and technical notes.

GRADUATE STUDENT ADVISING

- Gavin Black, Ph.D. Dissertation Committee Member, 2023
- Mark Maldonado, Ph.D. Dissertation Committee Member, 2023

TEACHING/INSTRUCTOR - COURSES & SEMINARS

- "AI and the Law": 6-week seminar on current litigation in AI Law.
- "Presentation Skills Workshop": 1-hr seminar, given semi-annually
- "Technical Writing Skills Workshop": 1-hr seminar, given semi-annually
- "Research Skills Workshop": 1-hr seminar, given semi-annually
- "Data Science Boot Camp": 2-week course with 3 levels (beginner, intermediate, and advanced).
- "Demystifying AI for Senior Leaders": 2-hr seminar on real-life applications of AI.
- "Demystifying AI for Senior Technical Leaders": 2-hr seminar on real-life applications of AI.

MEMBERSHIPS

- American Institute of Aeronautics and Astronautics (AIAA) – Senior Member.
  - AIAA Aircraft Design Technical Committee (ADTC) – Member 2006-Present.
- Institute of Electrical and Electronic Engineers (IEEE) – Senior Member.
- American Medical Association (AMA) – Member.
- American Bar Association (ABA) – Member.

PATENTS

- "Modeling and Generation of Network Traffic for Network Security, Simulation and Modeling," US Patent # 63/339,878, 05/09/2022
- "Offensive and Defensive Security Dataset Augmentation with Invariance and Distribution Independence," US Patent # 63/481,213, 01/24/2023
- "Multi-Distribution Anomaly Detection and Temporal Set-Similarity Matching for Anomalous Cybersecurity Behavior Classification and Clustering," US Patent # 63/481,207, 01/24/2023
- "Machine Learning Tools for Endpoint Platform Security," US Patent # 63/481,242, 01/24/2023
- "Game theory and generative AI for simultaneous development of offensive and defensive cyber agents," filed 06/2023
- "Generative AI models for high-dimensional lattices in cyber cryptanalysis," filed 06/2023

PRESENTATIONS, INVITED TALKS & LECTURE SERIES

- **Invited panel speaker**, **American Bar Association**, Nov. 2023 "**Cybersecurity and AI Policy** and the War in Ukraine"
- Invited speaker, Alamo AFCEA, Nov. 2023, "**Cyber and AI**"
- **Invited keynote speaker**, **National Security Collaboration Center**, Nov. 2023, "**Cyber AI and Green ML**"
- Invited speaker, Alamo ACE, Oct. 2023, "**Cyber and AI**"
- **Invited keynote speaker**, **San Antonio Chamber of Commerce**, Oct. 2023, "**Cyber AI** – The Next Generation of Cyber"
- **Invited keynote speaker**, **National Security Collaboration Center**, Aug. 2023, "**Cyber AI** – Returning to First Principles"
- Invited speaker, NIU "AI/ML Seminar Series", Mar. 2023, "AI - Stop the Big, Dumb, Models"
- **Invited keynote speaker**, **C3E Conference**, Nov. 2022, "**Cyber AI** – Returning to First Principles"
- Invited speaker, Defense Scoop Nov 2021, "**AI for Defense**"
- Invited speaker, USAF Classified Conference, Jan. 2020, "**Cyber Offense and Defense using AI/ML**"
- Invited speaker, NSA Resident Signals Engineers, Mar. 2020, "**Data Science for SIGINT**"
- **US Congress – Senate and House**, Classified presentation to member of the Senate Select Committee on Intelligence (SSCI), House Permanent Select Committee on Intelligence (HPSCI), and Senate Appropriations Committee (SAC), Jan. 2020, "**AI/ML in SIGINT**"
- **US Congress – Senate and House**, Classified presentation to SSCI and HPSCI, Feb. 2020, "**AI/ML in HUMINT**"
- **US Congress – Senate and House**, Classified presentation to SSCI and HPSCI, Mar. 2020, "**AI/ML in IMINT and MASINT**"
- Speaker, IEEE ACC 2017, "GPS-INS Outlier Detection & Elimination using a Sliding Window Filter"
- Speaker, IFAC 2017, "Robust GPS-INS Outlier Accommodation: A Soft-thresholded Optimal Estimator"
- Co-speaker, ION 2016, "Signals of Opportunity Aided Inertial Navigation", **Best paper award**
- Invited speaker, IEEE CDC 2016, "Vehicle State Estimation: A Comparative Study"
- Speaker, ION 2015, "Enhanced State Estimation for Wheeled Vehicles"
- Speaker, AIAA InfoTech 2011, "Covert, Re-usable and Multi-role (CRaM) UAV"
- Speaker, AIAA InfoTech 2011, "Blended-Wing-Body Lateral-Directional Stability Investigation using 6DOF Simulation"
- Speaker, CFDSC 2010, "Lateral-Directional Stability Investigation of a Blended-Wing-Body"